



## The 2002 Governor's Award for Pollution Prevention and Sustainable Practices

### Application Cover Page

#### Applicant Information

Company/Organization Name: Columbia River Carbonates

Product/Service: ultra-fine ground calcium carbonate      Number of employees: 51

Location address: 300 North Pekin Road, Woodland, WA 98674

Contact Name: Reed Sherar      Title: Environmental Officer

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Have you applied for this award in previous years?      x Yes   ? No   When? 2000

Are attachments included? x Yes   ? No   How will they be sent?   x with application   ? separately

#### Nomination Information

*If someone other than the applicant (above) completed this application, please provide the following information:*

Name: Jacek Anuszewski      Title: Environmental Engineer

Phone number: (360) 407-6288      Fax number:

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#### Category

Please indicate which category best describes your facility:

**Business**    Medium (50-249 employees)

## **OVERVIEW:**

### **A. Columbia River Carbonates**

Columbia River Carbonates [CRC] was established in 1985 as a supplier of high grade ultra-fine ground calcium carbonate products and technical service for the paper, paint and plastic industries throughout the Pacific Northwest. The company's high grade limestone quarry is situated in Okanogan County. Stone is quarried and shipped by rail to Woodland, Washington where it is processed into both dry and slurry products. CRC processes nearly 180,000 tons of mineral per year at its 16 acre plant site and has 51 employees. The company is a general partnership owned by Bleeck Management, Inc., a local family-owned enterprise, and Pltauferra, the Swiss owned world leader in calcium carbonate production.

### **B. Pollution Prevention and Sustainable Practices.**

**Waste Water.** Our production process generates two process wastewater streams which, prior to 1998, were treated in four settling lagoons and discharged to the Columbia River pursuant to NPDES Permit No. WA0039721. Beginning in 1998 and completed in 2000, CRC developed, installed and implemented an innovative wastewater treatment system which enables the company to recycle treated wastewater for production use, dramatically reduces city clean water usage, removes solids without the need for settling lagoons (thereby eliminating treatment and excavation of solids/sludge), and eliminates discharge of wastewater to the waters of the state.

- Wastewater stream 1 - froth flotation waste. In order to remove impurities such as graphite and clay from the stone, raw material is cleansed in a froth flotation facility that utilizes two chemical additives: a specialty oil and a quaternary amine solution (potentially toxic to marine life). Prior to January, 1998 wastewater from this facility was treated in two double-lined lagoons and contained calcium carbonate, graphite, quartz and clay particulates.
- Wastewater stream 2 - process wash-down water. The second waste stream consists primarily of plant and rail car wash water containing relatively high levels of calcium carbonate particulates. Prior to August of 1999, this stream was treated in two unlined lagoons.
- Prior to conversion to a new water treatment system for each stream, CRC treated and discharged more than 14 million gallons of process water to the Columbia River each year. Since fall of 1998, the entire froth flotation wastewater stream has been recycled into production. In 1999, the process wash-down water system enabled CRC to operate at zero discharge for a period of nine months. CRC is currently operating at zero discharge and, outside of intermittent discharges dictated by upset conditions or excessive rainfall events, will continue to so operate by recycling 100% of its process waste water for production and plant wash-down water.

**Storm Water.** The new wastewater treatment system enabled us to eliminate our largest settling lagoon. This pond was cleaned, planted, and converted to a natural, storm water detention and treatment facility thereby enhancing our ability to manage storm water runoff. In 2001, CRC (1) installed an evaporator/oil-water separator for its large compressor at a cost of \$32,000.00 which eliminated all blow-down water (and oil) from storm water, and (2) \$10,000.00 in asphalt curbing to eliminate risk of particulates/chemicals from spilling or tracking to asphalt. This year we equipped all storm drains with Ultra-Urban catch-basin filters (Clean Water Technologies) that remove all oil/grease/hydrocarbons from water. Our stormwater runoff is clean and clear.

**Air Quality.** In 1998, the company invested heavily in controls to eliminate fugitive dust. Extensive plant site paving, vegetation ground cover/landscaping enhancements, full enclosure of our stone rail car unloading facility, addition of dust fogging systems, and enclosure of outside screens and transfer points have virtually eliminated dust problems. These enhancements were initiated and implemented voluntarily in response to neighbor concerns, and were not required by SWAPCA, our local air quality control authority.

**Noise Abatement.** In addition to air quality enhancements, in 1998 CRC retained an industrial noise-engineering firm to evaluate potential enhancements in abating plant noise sources. As a result, we enclosed outside equipment and facilities, insulated buildings containing loud machinery, installed silencers for fans, and insulated chutes. Again, this action was taken in response to Woodland community input.

**Solid Waste.** The solids produced by our water treatment system are approved for use as Agricultural Lime by the State of Oregon Department of Agriculture and are registered in Washington under the new “waste-derived” fertilizer law. Our “liquid lime” has been touted as the premier pH soil conditioner in the Pacific Northwest. The ultra-fine particle size of our calcium carbonate promotes extremely fast assimilation by soils and plants, thereby enabling farmers to adjust pH quickly and accurately. The byproduct usage eliminates the need for costly landfill, which is detrimental to both the company’s bottom line and the environment.

In addition, improvements in our process coupled with the new water treatment system have reduced the volume of solid waste/byproduct by 50-60%. Whereas in the past, we excavated and shipped 10-12,000 tons of material from our settling lagoons each year, today we generate only 4-5,000 tons on an annual basis.

## **APPLICATION QUESTIONS:**

**1. Benefits Achieved.** CRC has derived significant economic benefit from the subject improvements. Our employees have a safer, cleaner work environment. The community of Woodland and the environment are better for these changes.

- **Environmental Benefits**

Waste reduction – *Reducing or eliminating emissions to air **and** water at the source;* As set forth above, some 14 million gallons of treated process water each year will no longer flow to the Columbia River. Also, as a result of the modifications made to the plant facility, fugitive dust and PM<sub>10</sub> emissions have been virtually eliminated.

Resource Conservation – *Increasing the use of renewable and recycled materials.* Process water is now reused in both product make up and plant wash down. Minerals, which were formerly considered as waste, are now used to beneficiate farmland.

Resource Conservation – *Reducing energy use . . . .* Heavy equipment was utilized on a regular basis to manage and excavate settling lagoons (e.g. Cat excavator, front-end loader). The new system eliminates “double handling” of the material and the need for this equipment, resulting in substantial savings in capital and diesel fuel for the company, and elimination of diesel fuel emissions for the environment. In addition, thousands of gallons of treatment chemicals have been eliminated.

Resource Conservation – *Reducing water use.* In 1997, prior to implementing changes in water use and treatment, CRC used a total of 23 million gallons of Woodland City Water. In 1998, consumption fell to 12 million gallons – nearly half. In 1999, CRC used only 10 million gallons of clean, city water **at the same time production levels increased by 50% over 1997!** Even less will be used this year and in the future. Water usage has been reduced by more than 60%.

- **Economic Benefits**

Chemical costs for water treatment have been reduced by 60% over pre-1998 requirements. These costs are expected to go even lower after the remaining (pre-1998) material from two of the lagoons is gone. City water usage, and the resulting bill, are reduced by nearly two thirds. Labor costs for managing and excavating the lagoons are dramatically less. Of course, the incalculable cost attached to the ongoing liability risks associated with any environmental discharge is curtailed.

- **Employee Benefits**

The work site for process water management, treatment and discharge has improved in terms of working conditions, safety and overall manageability. Most of the system is automated and self-maintaining. What once took labor-intensive, often hazardous round-the-clock attention can now easily be operated and managed by a single employee during regular business hours.

- **Community**

As a result of the modifications implemented for noise and dust control, the community of Woodland is far less impacted by our industrial site. Our public image has turned for the better a full 180 degrees; the company is now seen as a responsible, corporate citizen. The Washington Department of Ecology has also recognized CRC's commitment to good environmental stewardship. On April 27, 2000, Mr. Charles Hoffman, Environmental Engineer for the DOE's Water Quality Program, performed an inspection of CRC for compliance with all NPDES Permit requirements, including the new wastewater treatment system. In the Water Compliance Inspection Report, Mr. Hoffman writes:

**“Conclusion. CRC initiated, without Ecology requiring, the process to evaluate and implement treatment to achieve zero discharge of process wastewater. Ecology congratulates CRC for their concern for the environment and their environmental stewardship by working towards the goal of achieving zero discharge of process wastewater.”** [This conclusion was reiterated by DOE inspector Jacek Anuszewski, P.E. in his inspection report dated June 20, 2001. Mr. Anuszewski recommended that CRC reapply for this Governor's Award.]

## 2. **Innovation.**

The maintenance and management of settling lagoons for treatment of process wastewater is cumbersome, expensive and standard in most industrial facilities. CRC is a small company and, as such, needs to be innovative in finding ways to improve our processes, enhance efficiencies, and reduce our costs. The owners of CRC are also firmly committed to a safe and environmentally sound workplace. In late 1997, a team of employees was formed to attack the problems inherent with our settling ponds, wastewater and sludge disposal. This team consisted of the Environmental Officer, Maintenance/Controls Manager, Assistant General Manager, Chief Chemist, and Production Manager. In the face of much negativism and nay-saying within the company (including many of the top marketing, technical, and engineering staff), the decision was made to create an entirely new wastewater

treatment program which would encompass zero discharge, 100% process wastewater recycle, and reduction/elimination of settling lagoons at CRC.

This was not to be an easy task as there was no help or experience in this arena from our industrial counterparts. One of the two partners of CRC, Pluess-Staufner (Omya), is the world leader in our industry, producing more than 6.5 million tons of ground calcium carbonate worldwide annually for the paper industry alone. They operate more than 140 production and distribution locations in 30 countries. Not one of these facilities recycles wastewater. We were unable to locate any mineral processing facilities that effectively recycled wastewater. We explored and evaluated numerous options available on the open market that purported to solve our problems. None of these alternatives turned out to be viable for our needs – at any cost. There seemed to be no viable, usable technology to suit our purpose “out there”.

A member of the team, Maintenance/Controls Manager Gene Kohout, developed an idea and drafted the first design on a paper napkin. Solids would be removed from process water with a centrifuge. The “cake” would be shipped off site as accumulated and not stockpiled. The centrate water would be monitored for solids and chemical content and stored for reuse in the plant as wash water and product make-down water. As to the flotation waste stream, the same process could be utilized and centrate recycled directly to the flotation cells for re-introduction to the production process.

A simple enough process on “paper”; but would it work? The primary concern was the impact of potential chemical buildup in the water utilized for production. Concern was registered that product quality, even the ability to produce viable product at all with recycled water, were at stake. Our technical staff scientists said “no”; chemical buildup in the recycle water would upset flotation conditions as well as negatively impact slurry production and product specifications. The team moved forward and ran trials with a rental centrifuge and “jury-rigged” set up. The next step was a bona fide mill trial with water produced by the system. The process and the recycled water appeared to work quite well. Recycled water could be used in the production process and the process stabilized. Months of continuous trial runs demonstrated that it would work, but there were numerous failures and condition upsets along the way. We knew that there would be a learning curve, but that ultimately the system was sound.

Our Swiss partner is now quite interested in the recycle system and we have, of course, shared all pertinent information on the system with the partner. At CRC we feel strongly that our system is a unique and effective solution for eliminating process water discharge.

### **3. Leadership and Commitment.**

This success story could not have been written without the courage and leadership attributable to the owners of Columbia River Carbonates. As a privately held company, both partners took a sizable risk in approving and moving forward with this project. All of the environmental measures taken by CRC, as enumerated above, were voluntary and reflect their sincere and focussed commitment to the community of Woodland, the State of Washington, and the environment.

Nearly \$2 million has been invested by the company to achieve these goals (not to mention the number of hours, days and weeks of time invested by key employees). For a company of our size, this is a significant commitment of resources (and profits) to dedicate for “exploratory” environmental projects. The investment was, ultimately, well placed. The economics of the project, the cost savings to be recognized over the coming years, and the reduction of environmental liabilities will prove to be “good business” by any standards.